

DESIGN OF JUNCTION BOX EM PACKAGE.

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The so-called environmental module at the Junction Box has a number of important functions in addition to carrying environmental sensors and hydrophones. It will carry a sensitive TV camera and a strong light, to illuminate the junction box when RUM is making connections there, and it will serve as a relay point for C^2 and C^3 communications, sending back TV signals as well as data from the JB itself (regulator current, e.g.). A sketch of the EM package is shown in Fig. 1, and a functional diagram is displayed in Fig. 2.

In Fig. 2, the usual 4-fold cable connection contains one electrical cable and 3 fiber-optics connectors. We note that, in addition to the flotation module, there are four separate packages external to the EM itself: the sensor package, which contains the usual environmental sensors; the hydrophone, which is attached to the EM; the TV camera, and the TV light, both of which are mounted so that they can be pointed at will. Each of these external packages must be supplied with power, and (except for the light) must return data to the EM, and receive control signals from it. These come from the microprocessor unit; the latter also processes sensor data. Hydrophone and TV signals are processed, as necessary, and sent to shore via a wide-band data link. Fiber No. 12 is used for this purpose. C^2 and C^3 data are returned to shore via the microprocessor, on fibers no. 10 and 11.

Fig. 1 shows the EM package connected to the junction box. It is planned to use the short string containing the EM as a lifting device for the JB during deployment. This may be a somewhat ticklish operation, since the shore cable is trailing behind the junction box. However, it is contemplated that the shore power supply will be in operation, so that the TV camera and lights are active, and the deployment operation will therefore be monitored on shore. It can also be monitored on shipboard, via the TV camera attached to RUM. To obtain a shipboard display of the JB EM camera, a shore-to-ship TV radio link will be required. (A ship-to-shore TV link is required for this operation.)

The EM package doubles as a lifting harness for the JB during deployment. It can be released from the JB by RUM if replacement of the package becomes necessary.

It should be reconsidered whether it is worth while adding to the EM a transponder that could serve also as an interrogator for the acoustic transponders as well as a pinger for the array hydrophones. The location of that pinger is presently fixed in several of the SBC's. It may be worthwhile to place one in the JB EM as well.

During deployment a transponder on the JB would be very helpful in locating it on the bottom, and in following the JB on its way down. If left there, it would form a fourth element in the transponder network; or, if desired, it could be recovered after the deployment operation was over and the JB location accurately known. If left in place, and powered by an internal battery (kept charged by shore power, if that turns out to be feasible) it would serve as a guide for the recovery of the junction box and cable in the event of catastrophic cable failure.

JB EM POWER SUPPLIES. Although only a single power supply is shown in Fig. 2, the actual supply will certainly consist of more than one. The TV light, for example, can take as much as 1kw of power, and will almost certainly require a separate supply, individually controlled from shore.

The power supply needs are as follows:

1. TV light: up to 1kw, possibly variable. Separate supply. Still undecided: how many lights, what color, how distributed - on string or on lateral boom?
2. Pan and tilt controls for TV camera (and lights, if needed.)
3. TV camera, with FM modulator and RF carrier. Probably color, high sensitivity, with zoom lens.
4. Electronic equipment as follows:
 - a. Hydrophone and signal conditioner
 - b. Microprocessor and associated electronics
 - c. $C^2 - C^3$ interface (includes 2 lasers)
 - d. Two laser transmitters
 - e. Sensor modules

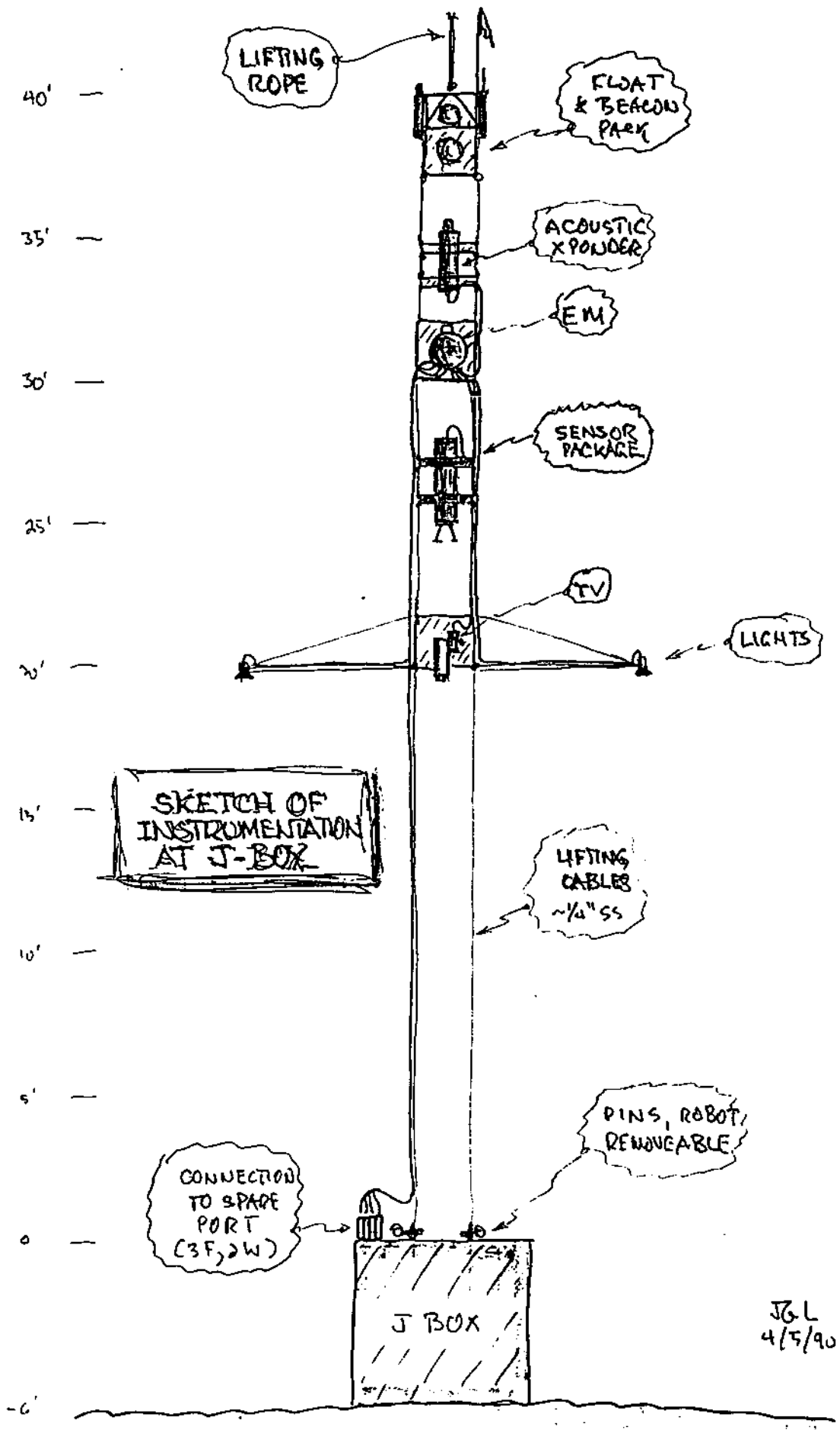


Fig. 1. EM Package

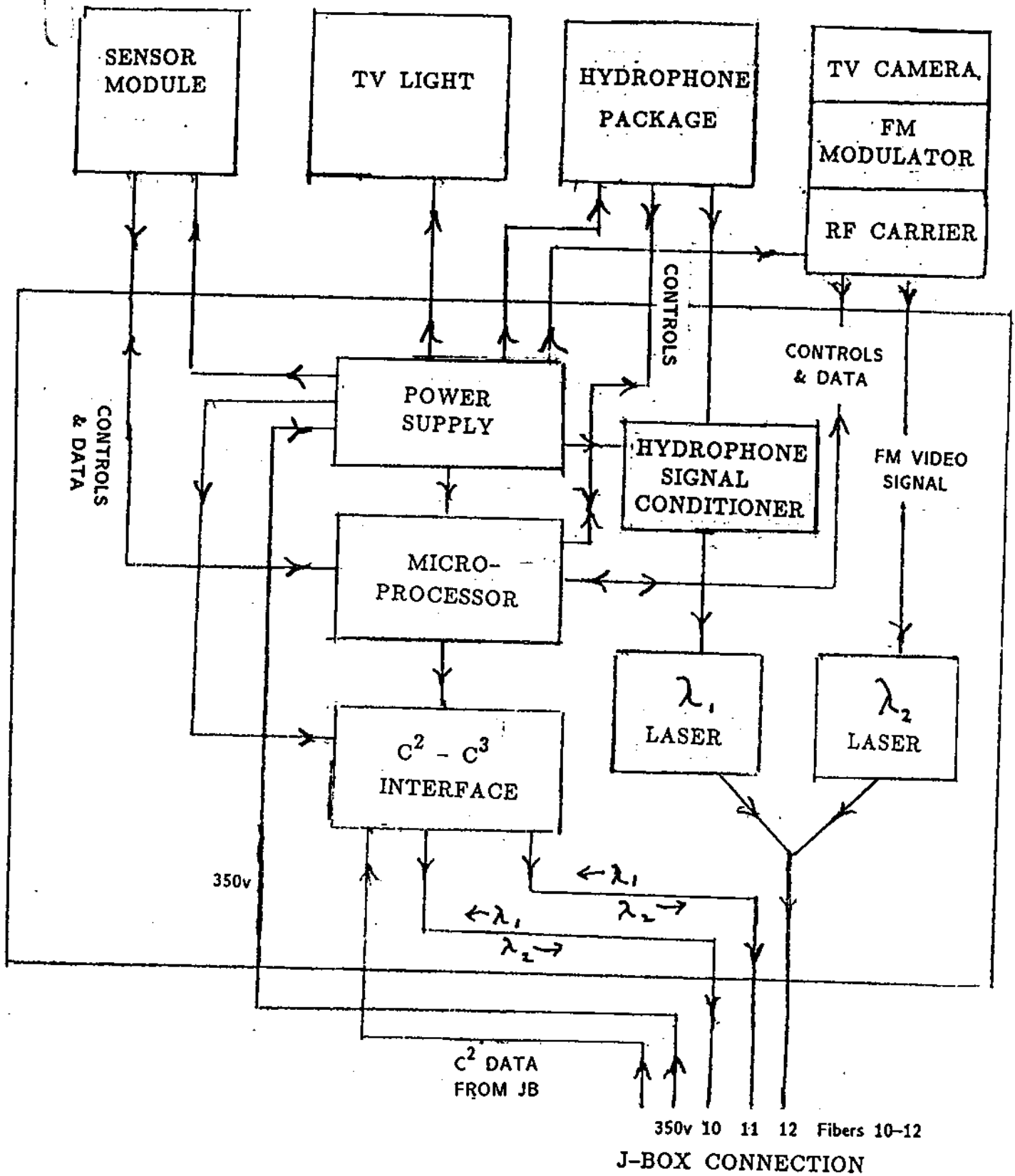


Fig. 2. Functional Diagram of Junction Box EM Package.

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